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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/998,560	11/29/2001	Kristina Vogt	Mo-6644/LeA 34,976	5906

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PATENT DEPARTMENT
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EXAMINER

UMEZ ERONINI, LYNETTE T

ART UNIT

PAPER NUMBER

1765

DATE MAILED: 05/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/998,560

Applicant(s)

VOGT ET AL.

Examiner

Lynette T. Umez-Eronini

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 17-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 17-20 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or ~~PTO/SB/08~~)
Paper No(s)/Mail Date 11/29/2001, 5/9/2002 and 11/12/2003
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 1-16 in Paper filed 2/9/2004 is acknowledged.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu (US 4,857,290).

As pertaining to claims 1, 8, and 11, Shimizu teaches a process for producing silica comprising: treating an acidic silicate sol composition with hydrogen peroxide, adjusting the pH of the sol to 0 to 5 by adding a base selected from the group consisting of sodium hydroxide and potassium hydroxide (claim 1), which reads on,

A polishing slurry comprising:

- (a) a silica sol that contains SiO₂ particles, and
- (b) hydrogen peroxide and a base in an amount that is sufficient to set the pH of the polishing slurry at a pH that falls within the range of 5 to 11.5.

Shimizu differs in failing to specify from 2.5 to about 70% by volume of silica sol that contains from 15 to 40% by weight SiO_2 particles having a mean particle size of less than 300 nm, 6 to 10% by volume of hydrogen peroxide and the slurry at a 22°C, **in claim 1;**

the percent by weight of SiO_2 in silica sol, **in claims 2-5;**

the percent by weight of SiO_2 in the slurry, as specified **in claim 6;**

the percent by volume of hydrogen peroxide in the slurry, **in claim 7;**

a pH ranging from 6 to about 10, **in claim 9** of the polishing slurry; and

the removal rate of more than 300 Å/min, a Cu:Ta selectivity of more than 1:2, a Cu:dielectric selectivity of more than 1:1 or greater, **in claim 10.**

Shimizu further differs in failing specify from about 2.5 to about 70% by volume of silica sol containing SiO_2 particles, from about 6 to 10% by volume of hydrogen peroxide and the slurry at a 22°C, a Ta removal rate of more than 300 Å/min, a Cu:Ta selectivity of more than 1:2, a Cu:dielectric selectivity of more than 1:1 or greater, and the Ta removal rate is ≥ 1.5 times the removal rate of a dielectric that can be polished by the slurry, **in claim 11;**

the mean particle size of less than about 300 nm and the percent by weight of SiO_2 in the silica sol, **as recited in claim 12;**

the percent by weight of SiO_2 in, **in claims 13-15;** and

the percent by weight of SiO_2 in the slurry, **as recited in claim 16.**

It would have been obvious to one having ordinary skill in the art at the time of the claimed invention to use any combination of parameters such as the removal rate,

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polish selectivity, pH, temperature, percent by weight and percent by volume of the components of the slurry as taught in the Shimizu's reference and including those presented in applicants' claim for the purpose of producing a high purity sol (Shimizu, column 3, lines 33-40).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynette T. Umez-Eronini whose telephone number is 571-272-1470. The examiner is normally unavailable on the First Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571-272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ltue

April 22, 2004

NADINE G. NORTON
SUPERVISORY PATENT EXAMINER

